

REMARKS

Status of the Claims

Claims 1 – 5, 7 – 27, and new claim 28 are pending, with claims 1, 9, 13, 18, and 21 being independent. Claim 6 has been cancelled without prejudice to or disclaimer of the subject matter contained therein. Without conceding the propriety of the rejections, claims 1, 9, 13, 18, 21, 26, and 27 have been amended to even more clearly recite and distinctly claim the invention. Support for the amendments may be found in the original claims as well as throughout the specification. New claims 28 have been added. Support for the new claim may be found throughout the specification including, for example, at page 7, paragraph [0028]. Therefore, no new matter has been added.

Applicants respectfully request the Examiner to reconsider and withdraw the outstanding rejections in view of the foregoing amendments and the following remarks.

The Present Invention

The present invention relates to a method of inhibiting oxidation of a Fischer-Tropsch product and blended hydrocarbonaceous products that resist oxidation. According to the present invention, it has been recognized that Fischer Tropsch products tend to have stability problems during shipment and storage. It has been recognized that these stability problems occur because Fischer Tropsch products tend to oxidize relatively rapidly when exposed to air, and thus, Fischer Tropsch products are prone to oxidation during shipment and storage. (page 7, paragraph [0029]). In particular, the oxidative instability in Fischer Tropsch products has been linked to the formation of peroxides. The presently claimed methods and blended products address the increased need for effective antioxidants during shipment and storage of Fischer Tropsch products. (page 7, paragraph [0029]).

In particular, the presently claimed invention relates to methods of inhibiting oxidation of a Fischer Tropsch product comprising adding an effective amount of a petroleum-derived hydrocarbonaceous product to provide a blended product having a sulfur content of greater than 1 ppm and less than 100 ppm and a final peroxide number of less than 5 ppm after 7 days. In another aspect, the presently claimed invention relates to methods of inhibiting oxidation of a

Fischer Tropsch product comprising adding an amount of a petroleum-derived hydrocarbonaceous product, which contains sulfur, to provide a blended product having a final peroxide number of less than 5 ppm after 7 days and processing the blended product with hydrogen to provide a final product with a sulfur content of less than 100 ppm.

In an additional aspect, the present invention relates to methods of inhibiting oxidation of a Fischer Tropsch product comprising creating a blended hydrocarbonaceous product by mixing (i) a Fischer Tropsch product, (ii) a sulfur-containing petroleum-derived hydrocarbonaceous product, and (iii) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof. The blended product has a final peroxide number of less than 5 ppm after 7 days and the effective amount of antioxidant in (i) and (ii) is less than the amount that would be required in (i) alone. As the specification teaches, these conventional antioxidants are expensive and the presently claimed invention provides methods of inhibiting oxidation and blended products, which resist oxidation, and that require reduced amounts of these expensive antioxidants. The presently claimed invention also relates to the blended hydrocarbonaceous products.

Claim Rejections Under 35 USC §103

Claims 1 and 3-8 are rejected under 35 USC §103(a) as being obvious over Berlowitz (U.S. Patent No. 6,080,301) or Berlowitz (U.S. Patent No. 6,165,949) in combination with Smalheer. Applicants respectfully disagree with the rejections; therefore, these rejections are traversed.

Berlowitz '301 relates to a premium synthetic lubricating oil base stock. The synthetic lubricating oil base stock of Berlowitz is made by a Fischer Tropsch process. Berlowitz teaches that the base stock may be blended with one or more base stocks selected from the group consisting of (a) a hydrocarbonaceous base stock, (b) a synthetic base stock, and mixtures thereof. (Col. 2, lines 30-33). Berlowitz teaches that by hydrocarbonaceous it is meant a primarily hydrocarbon type base stock derived from a conventional mineral oil, shale oil, tar, coal liquefaction, and mineral oil derived slack wax. (Col. 5, lines 6-10). Berlowitz further teaches that typical examples of base stocks to be blended with the base stock of the invention

include base stocks derived from PAO, mineral oil, mineral oil slack wax hydroisomerate, and mixtures thereof. (Col. 2, lines 33-36).

Berlowitz teaches, and in the Examples demonstrates, that Fischer-Tropsch derived base stocks are different, and most often superior to, lubricants formed of other base stocks. (Col. 2, lines 36-44). In the Examples, Berlowitz tests the oxidation resistance or stability of the base stock without any additives along with the oxidation stability of a conventional mineral oil derived base stock (S150N). (Example 1 at Col. 10, lines 34-47, Table 5, and Example 2 and Table 6). As tested by Berlowitz, the Fischer Tropsch base stock exhibits superior stability to the conventional base stock. (Col. 10, lines 45-47, Table 5, and Table 6).

Berlowitz '949 relates to a wear resistant lubricant comprising at least 95 weight % non-cyclic isoparaffins derived from waxy, paraffinic Fischer Tropsch synthesized hydrocarbons in admixture with an effective amount of an antiwear additive wherein the antiwear additive is at least one of a metal phosphate, a metal dithiophosphate, a metal dialkylthiophosphate, a metal thiocarbamate, a metal dithiocarbamate, an ethoxylated amine dialkyldithiophosphate and an ethoxylate amine dithiobenzoate. Berlowitz teaches that the amount of antiwear additive required to achieve a lubricant of a given level of wear resistance using a lubricant base stock derived from waxy Fischer Tropsch synthesized hydrocarbons is less than that required for a similar lubricating oil based on conventional petroleum oil. (Col. 1, lines 57-63). Berlowitz further teaches that the Fischer Tropsch synthesized base stocks comprising the antiwear additives demonstrate wear protection superior to a conventional mineral oil derived base stock. (S150N) (Example 2, Tables 4 and 5).

Smalheer provides a general discussion of lubricant additives. As such, Smalheer provides a summary of the chemistry of additives, including anti-oxidants.

In contrast, the present invention is directed to methods of inhibiting oxidation during the shipment and storage of Fischer-Tropsch products due to their tendency to oxidize rapidly when exposed to air. Therefore, the present invention provides methods of inhibiting oxidation of Fischer-Tropsch products and blended hydrocarbonaceous products comprising Fischer Tropsch products that resist oxidation. The presently claimed methods and blended products address the increased need for effective antioxidants during shipment and storage of Fischer Tropsch products. The blended products of the presently claimed invention have superior oxidation

resistance, in particular peroxide resistance, compared to that of the Fischer Tropsch product alone. According to the present invention, a sulfur-containing petroleum-derived hydrocarbonaceous product is blended with a Fischer Tropsch product in an effective amount to improve the oxidation resistance of the Fischer Tropsch product and to provide a blended product with superior oxidation resistance, in particular, to provide a blended product having a final peroxide number of less than 5 ppm after 7 days.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143.

It is respectfully submitted that in no way does Berlowitz address the problem of stability of Fischer Tropsch products during shipment and storage. In addition, in no way does Berlowitz teach or suggest that the instability of Fischer Tropsch products during shipment and storage is, at least in part, due to the formation of peroxides. Furthermore, in no way does Berlowitz teach or suggest that the storage stability problem can be addressed by inhibiting the oxidation of the Fischer Tropsch product. In fact, Berlowitz teaches that the oxidation resistance and stability of Fischer Tropsch products are superior to conventional base stocks (Example 1, Table 5 and Example 2, Table 6).

Accordingly, it is respectfully submitted that Berlowitz does not teach or suggest inhibiting the oxidation of Fischer Tropsch products by adding a sulfur-containing petroleum-derived hydrocarbonaceous product. Berlowitz does not teach or suggest an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product to be added to a Fischer Tropsch product to provide a blended product having a final peroxide number of less than 5 ppm after 7 days. In addition, Berlowitz does not teach or suggest adding a sulfur-containing petroleum-derived hydrocarbonaceous product to a Fischer Tropsch product to provide a blended product having a sulfur content of greater than 1 ppm and less than 100 ppm.

Smalheer merely teaches the chemistry of known lubricant additives, including anti-oxidants. Accordingly, it is respectfully submitted that even if there were some suggestion or

motivation to combine Berlowitz and Smalheer and a reasonable expectation of success, Berlowitz and Smalheer, even when combined, do not teach or suggest all the claim limitations. Neither Berlowitz nor Smalheer teach or suggest a blended product comprising a Fischer Tropsch product, a sulfur-containing petroleum derived hydrocarbonaceous product, and an effective amount of antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof to provide a blended product having a final peroxide number of less than 5 ppm after 7 days, wherein that effective amount is less than the amount that would be required in the Fischer Tropsch product alone.

Accordingly, it is respectfully submitted that neither Berlowitz nor Smalheer in view of Smalheer teach or suggest all the claim limitations.

Claims 1-27 are also rejected under 35 USC §103(a) as being obvious over Wittenbrink (U.S. Patent No. 6,332,974). Applicants respectfully disagree with the rejections; therefore, these rejections are traversed.

Wittenbrink relates to a wide-cut lubricant base stock made from a waxy Fischer-Tropsch synthesized hydrocarbon fraction. Wittenbrink teaches that the base stocks of the invention may be combined with conventional additive packages including antioxidants such as hindered phenols and hindered aromatic amines. Wittenbrink further teaches that the base stocks of the invention may be blended with another base stock selected from the group consisting of (i) a hydrocarbonaceous base stock, (ii) a synthetic base stock, and mixtures thereof. Wittenbrink teaches that the Fischer Tropsch base stocks of the invention will have superior properties to the blends. (Col. 4, lines 40-41). Wittenbrink tests certain properties of the base stocks of the invention and compares these properties to those of a conventional lube oil fraction derived from petroleum oil. (Example 3). Wittenbrink concludes that the base stocks of the invention have superior properties to those of the conventional lubricating oil. (Example 3). Wittenbrink provides no teaching with regard to the oxidative stability of the lubricating oils.

It is respectfully submitted that in no way does Wittenbrink address the problem of stability of Fischer Tropsch products during shipment and storage. In addition, in no way does Wittenbrink teach or suggest that the instability of Fischer Tropsch products during shipment and storage is, at least in part, due to the formation of peroxides. Furthermore, in no way does Wittenbrink teach or suggest that the storage stability problem can be addressed by inhibiting

the oxidation of the Fischer Tropsch product. In fact, Wittenbrink teaches that the oxidation resistance and stability of Fischer Tropsch products are superior to conventional base stocks (Example 1, Table 5 and Example 2, Table 6).

Accordingly, it is respectfully submitted that Wittenbrink does not teach or suggest inhibiting the oxidation of Fischer Tropsch products by adding a sulfur-containing petroleum-derived hydrocarbonaceous product. Wittenbrink does not teach or suggest an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product to be added to a Fischer Tropsch product to provide a blended product having a final peroxide number of less than 5 ppm after 7 days. In addition, Wittenbrink does not teach or suggest adding a sulfur-containing petroleum-derived hydrocarbonaceous product to a Fischer Tropsch product to provide a blended product having a sulfur content of greater than 1 ppm and less than 100 ppm.

Accordingly, it is respectfully submitted that Wittenbrink does not teach or suggest all of the claim limitations.

Therefore, withdrawal of the obviousness rejections is respectfully requested.

Double Patenting

Claims 1-27 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-12 of co-pending Application No. 09/966,298. Applicants believe that the present claims are patentable over the claims of the '298 application. However, to facilitate allowable subject matter, a terminal disclaimer over the '298 application will be submitted under separate cover, as appropriate, once allowable subject matter has been agreed upon. In view thereof, Applicant respectfully requests that this rejection be withdrawn.

Conclusion

Without conceding the propriety of the rejections, the claims have been amended, as provided above, to even more clearly recite and distinctly claim Applicants' invention and to pursue an early allowance. For the reasons noted above, the art of record does not disclose or suggest the inventive concept of the present invention as defined by the claims.

In view of the foregoing amendments and remarks, reconsideration of the claims and allowance of the subject application is earnestly solicited. The Examiner is invited to contact the undersigned at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted,

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